CLAIMS

What is claimed is:

1. A method comprising:

    applying a prediction filter to a unit of audio signal data;

    determining a distribution substantially representative of residual data generated as part of said applying of a prediction filter to the unit of audio signal data; and

    transmitting in substance the unit of audio signal data to a recipient, utilizing the determined distribution to assist in reducing the amount of data having to be transmitted.

2. The method of claim 1, wherein the method further comprises

    receiving a portion of a stream of audio signal data; and

    partitioning the stream of the audio signal data into a plurality of units of audio data.

3. The method of claim 2, wherein the partitioning comprises partitioning the stream of the audio signal data into a plurality of fixed-size units of audio signal data.

4. The method of claim 2, wherein the method further comprises

    selecting one of the plurality of units of audio signal data partitioned from the portion of the stream of audio signal data;

    performing said applying, determining and transmitting operations of claim 1 for the selected unit of audio signal data; and

    repeating the selecting and performing until all units of the partitioned audio signal data have been transmitted in substance to the recipient.

5. The method of claim 2, wherein the method further comprises

    further partitioning the selected one of the first plurality of units of audio signal data into a second plurality of units of audio signal data;

    selecting one of the second plurality of units of audio signal data;

performing said applying, determining and transmitting of claim 1 for the selected one of the second plurality of units of audio signal data; and

repeating the selecting of the second plurality of units of audio signal data, and the performing of said applying, determining and transmitting of claim 1 for the selected one of the second plurality of units of audio signal data, until all of the second plurality of units of audio signal data have been transmitted in substance to the recipient.

6.   The method of claim 5, wherein the method further comprises repeating the further partitioning, the selecting, the performing, and the repeating of claim 5, until all of the first plurality of units of audio signal data have been transmitted in substance to the recipient.

7.   The method of claim 1, wherein the method further comprises transmitting a plurality of parameters of the prediction filter to the recipient.

8.   The method of claim 7, wherein

the applying comprises applying a linear prediction filter having a prediction order p, and prediction coefficients $a_1, \ldots, a_p$; and

the transmitting of the parameters of the prediction filter comprises transmitting the prediction order p, information about quantization step size used to quantize prediction coefficients, and quantized versions of the prediction coefficients $a_1, \ldots, a_p$.

9.   The method of claim 1, wherein

the residual data comprises a plurality of residual samples;

the determining of a distribution comprises determining a plurality of statistical measures including a variance of the residual samples or an estimate of the variance;

forming a residual data distribution descriptor based at least in part on the determined variance of the residual samples or its estimate, the distribution descriptor identifying the substantially representative distribution to the recipient; and

the transmitting comprises transmitting the residual data distribution descriptor to the recipient.

10.   The method of claim 9, wherein

the determining of the statistical measures further comprises determining a mean of the residual samples; and

the forming of the residual data distribution descriptor is further based on the determined mean of the residual samples.

11.   The method of claim 9, wherein

the determining of the statistical measures further comprises determining at least a selected one of a skewness and a kurtosis of the residual samples; and

the forming of the residual data distribution descriptor is further based on the determined at least selected one of the skewness and the kurtosis of the residual samples.

12.   The method of claim 1, wherein

the residual data comprises a plurality of residual samples;

the method further comprises determining a number of least significant bits (LSB) of each residual sample to be sent to the recipient; and

the transmitting comprises transmitting to the recipient

how many LSB of each residual sample will be transmitted to the recipient and

the appropriate number of LSB of each of the residual samples.

13.   The method of claim 12, wherein the method further comprises determining a reconstructed inverse-quantized mean value of the residual samples, and the determining of the LSB of each residual sample to be sent to the recipient is performed based at least in part on the determined reconstructed inverse-quantized mean value of the residual samples.

14.   The method of claim 1, wherein

the residual data comprises a plurality of residual samples, each having a plurality of data bits;

the method further comprises encoding the most significant bits (MSB) of each of the residual samples, employing codes constructed using the determined substantially representative distribution; and

the transmitting comprises transmitting the encoded MSB of the residual samples to the recipient.

15. The method of claim 14, wherein the method further comprises constructing the codes using the distribution, the constructed codes being Huffman codes.

16. The method of claim 14, wherein the method further comprises constructing the codes using the distribution, the constructed codes being run-length codes.

17. The method of claim 14, wherein the method further comprises constructing the codes using the distribution, the constructed codes being Gilbert-Moore codes.

18. The method of claim 14, wherein the method further comprises constructing the codes using the distribution, the constructed codes being arithmetic codes.

19. An apparatus comprising
   a prediction filter;
   a transmission unit; and
   a control unit coupled to the prediction filter and the transmission unit, and adapted to apply the prediction filter to a unit of audio signal data to a recipient, and to use the transmission unit to transmit in substance the unit of audio signal data to the recipient, utilizing a distribution substantially representative of the residual data generated by the prediction filter to assist in reducing the amount of data having to be transmitted by the transmission unit.

20. The apparatus of claim 19, where the control unit is adapted to use the transmission unit to transmit a plurality of parameters of the prediction filter to the recipient.

21.   The apparatus of claim 19, where the control unit is adapted to use the transmission unit to transmit a residual data distribution descriptor formed using at least some of a number statistical measures of the residual data, to the recipient, the distribution descriptor identifying the substantially representative distribution, and statistical measures are employed to identify the substantially representative distribution.

22.   The apparatus of claim 19, wherein the apparatus further comprises a computation unit coupled to the prediction filter and the control unit, and adapted to compute at least a plurality of statistical measures for the residual data generated by the prediction filter.

23.   The apparatus of claim 19, where the residual data comprises a plurality of residual samples having data bits, and the control unit is adapted to use the transmission unit to transmit a plurality of the least significant bits (LSB) of each of the residual sample, to the recipient, the LSB of each of the residual sample transmitted being determined based at least in part on the determined substantially representative distribution.

24.   The apparatus of claim 19, where the residual data comprises a plurality of residual samples having data bits, and the control unit is adapted to use the transmission unit to transmit a plurality of codes, encoding the most significant bits (MSB) of each of the residual sample, to the recipient, the codes being constructed based at least in part on the determined substantially representative distribution of the residual samples.

25.   The apparatus of claim 24, wherein the apparatus further comprises an encoder adapted to encode the MSB of each of the residual samples, using codes constructed from determined substantially representative distribution of the residual samples.

26.   An apparatus comprising

a receiver unit;

a decoder coupled to the receiver unit; and

a control unit coupled to the receiver unit and the decoder, and adapted to use the decoder to recover a unit of audio signal data from an encoded transmission of the unit of audio signal received by the receiver unit, the encoded transmission included encoded most significant bits (MSB) and unencoded least significant bits (LSB) of residual samples of residual data generated by a prediction filter applied to the unit of audio signal data.

27.   The apparatus of claim 26, wherein the encoded transmission further includes a distribution descriptor constructed based on statistical measures of the residual samples, and the control unit is further adapted to at least contribute in causing a inverse-quantized mean of the residual samples to be reconstructed.

28.   The apparatus of claim 26, wherein the encoded transmission further includes a distribution descriptor constructed based on statistical measures of the residual samples, the distribution descriptor identifying the substantially representative distribution of the residual samples, and the control unit is further adapted to at least contribute in causing the substantially representative distribution to be available to the decoder for use to decode a plurality of codes received by the receiver unit, the codes encoding the MSB of the residual samples.

29.   A system comprising:

a prediction filter;

a transmission unit;

a receiver unit;

a decoder unit; and

a control unit coupled to the prediction filter and the transmission unit, and adapted to apply the prediction filter to a first unit of audio signal data to a recipient, and to use the transmission unit to transmit in substance the first unit of audio signal data to

the recipient, utilizing a distribution substantially representative of the residual data generated by the prediction filter to assist in reducing the amount of data having to be transmitted by the transmission unit, the control unit being further coupled to the receiver unit and the decoder unit, and adapted to use the decoder to recover a second unit of audio signal data from an encoded transmission of the second unit of audio signal received by the receiver unit, the encoded transmission included encoded most significant bits (MSB) and unencoded least significant bits (LSB) of residual samples of residual data generated by a prediction filter applied to the second unit of audio signal data.

30.   The system of claim 29, further comprising a transceiver unit comprising the transmitter and receiver units.

31.   The system of claim 29, further comprising an encoder unit coupled to the prediction filter and the transmission unit, to encode the MSB of the first unit of audio signal data, the MSB of the first unit of audio signal data being determined based at least in part on statistical measures of the residual samples generated by the prediction filter, when applied to the first unit of audio signal data.